

Technical Memorandum

To: Diane Salkie and Michael Sivak, USEPA

From: LPR Cooperating Parties Group

Date: August 14, 2018

Re: Use of Modeling in the Upper 9-Mile Interim Action Feasibility Study

The CPG's understanding is that the Upper 9-Mile Interim Action (IA) consists of two components:

1. A removal action that addresses surface sediments exceeding a remedial action level(s) (e.g., 300 ppt 2,3,7,8-TCDD) and subsurface sediments subject to erosion with the proviso that the removal achieves a post construction SWAC at or below 83 ppt of 2,3,7,8-TCDD between RM 8.3 and RM 17.4.
2. Adaptive management which involves monitoring the post-construction recovery of the upper 9 miles, establishing final remedial goals and determining whether further action is needed to achieve those goals.

EPA's current draft IA RAOs address surface and subsurface sediment to achieve a SWAC reduction target. They are derived from the site Conceptual Site Model (CSM) on which the IA is based. This CSM embodies our understanding of the river and our best sense of the outcome of the IA and has been judged by the CPG, EPA and CSTAG to be sufficient to support the IA. The current numerical models are based on this CSM and support the central idea that the sediments may be grouped based on recovery potential. However, **these models have not been used in crafting the first component of the Interim Action because of the recognized uncertainty of their long-term predictions.** Because the models can play a role in the longer-term adaptive management component if their uncertainty is greatly reduced, the Interim Action includes their refinement using the substantial quantity of data generated through baseline monitoring and pre-design sampling.

In its July 30, 2018 comments on the modeling-related sections of the Lower Passaic River Study Area Draft Remedial Investigation Report, EPA made clear its view that model predicted long-term trends are too uncertain to be of use in comparing remedial alternatives. This view was expressed most directly in Comments 1, 94 and 41:

*Comment 1 states, "The current level of accuracy in the models is acceptable for the RI/FS. Nevertheless, significant framework and parameter uncertainties associated with components of this complex system limit the accuracy of the models' predictions, especially related to delineating areas subject to erosion and deposition, and to surface sediment recovery trends. **A high degree of caution should be applied when using those predictions to compare remedial alternatives.**" (bold added to highlight text).*

EPA explained "caution" in Comment 94 by stating that the deficiencies are such that without improvement the models should not be used *"as a management tool."*

Comment 41 contains two statements that highlight elements of concern to EPA:

"...the limited accuracy of the models' predictions of erosion and deposition and of risk reduction over time due to the complexity of the system and certain data limitations should be considered when making regulatory decisions for the Lower Passaic and Newark Bay..."

"Long-term calibration to only one medium (sediment) and for only a portion of the site (RMs 0-8) limits the ability of the models to accurately predict long-term trends in chemical exposure via all media at all locations."

CSTAG also highlighted the uncertainty of the models in its April 25, 2018 Recommendations on the Lower Passaic River Study Area Proposed Interim Action. Its Recommendation 6 includes the statement, *"CSTAG recommends that the decision documents clearly state that the models are only estimates of future conditions and the accuracy of those predictions is constrained by model uncertainty and the limited available information at the time of the modeling."*

The CPG recognizes the uncertainty of long-term predictions, much of which is unavoidable given current data limitations and model resolution, and agrees they are unreliable in characterizing how long-term trends would differ among the remedial alternatives likely to be evaluated in the Interim Action Feasibility Study. Moreover, an assessment of such differences is not needed to evaluate alternatives vis-à-vis the RAOs. Thus, long-term projections should not be a component of the Feasibility Study.

The CPG believes the models could provide value to the Feasibility Study when used to gain insight on the following issues:

- The identification of locations that should be included in a remedy footprint due to high subsurface 2,3,7,8-TCDD or PCB concentration and vulnerability to erosion
- The types of cap likely to be needed in remediated areas
- The effect of resuspension during remediation on water column COPC levels and near-term recontamination.

The extensive use of modeling projections in the IA FS has the potential to significantly extend the FS schedule well beyond the 8-month goal the EPA has established. The CPG can produce a draft and final IA FS in 8 months if the modeling for the FS is limited to those uses summarized above, the number of alternatives is limited, and the resolution of major milestones (e.g. RAOs, remedial alternatives, engineering assumptions, Draft FS review etc.) occurs in a timely fashion.